

Progress on PNN2 PV

Ilektra A. Christidi
SUNY at Stony Brook

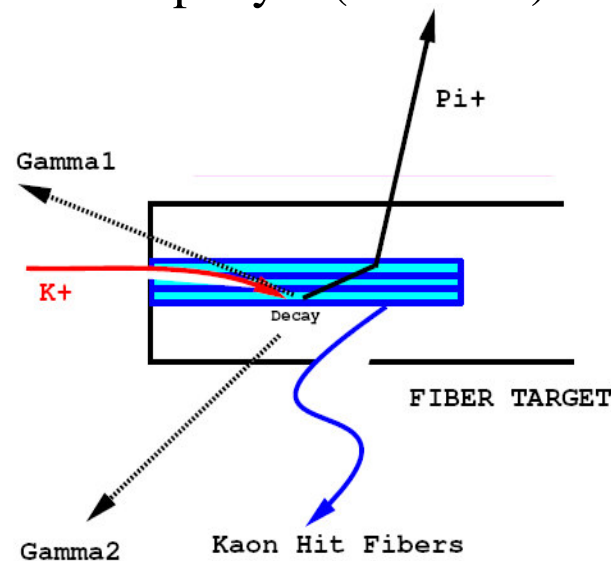
E949 analysis meeting
Sep 14 2004

Introduction

- Concentrate mainly on PV rejection of kinked events:

Remember, we need ~10 more than in 1998!

- From the new beam elements, only the AD was finally used
 - USPV, RV used in PSCUT before for good reason...
 - DSPV has very low statistics – to be revisited when more data will be available
- Can't optimize on kinked sample yet (statistics)



Setup cuts (1/6 sample)

Acceptance sample:

- km21
- STLAY, RSHEX, RSHEX2, PASS1, online PV
- KINCUT02_NOBOX
- KMU2BOX
- PSCUT02

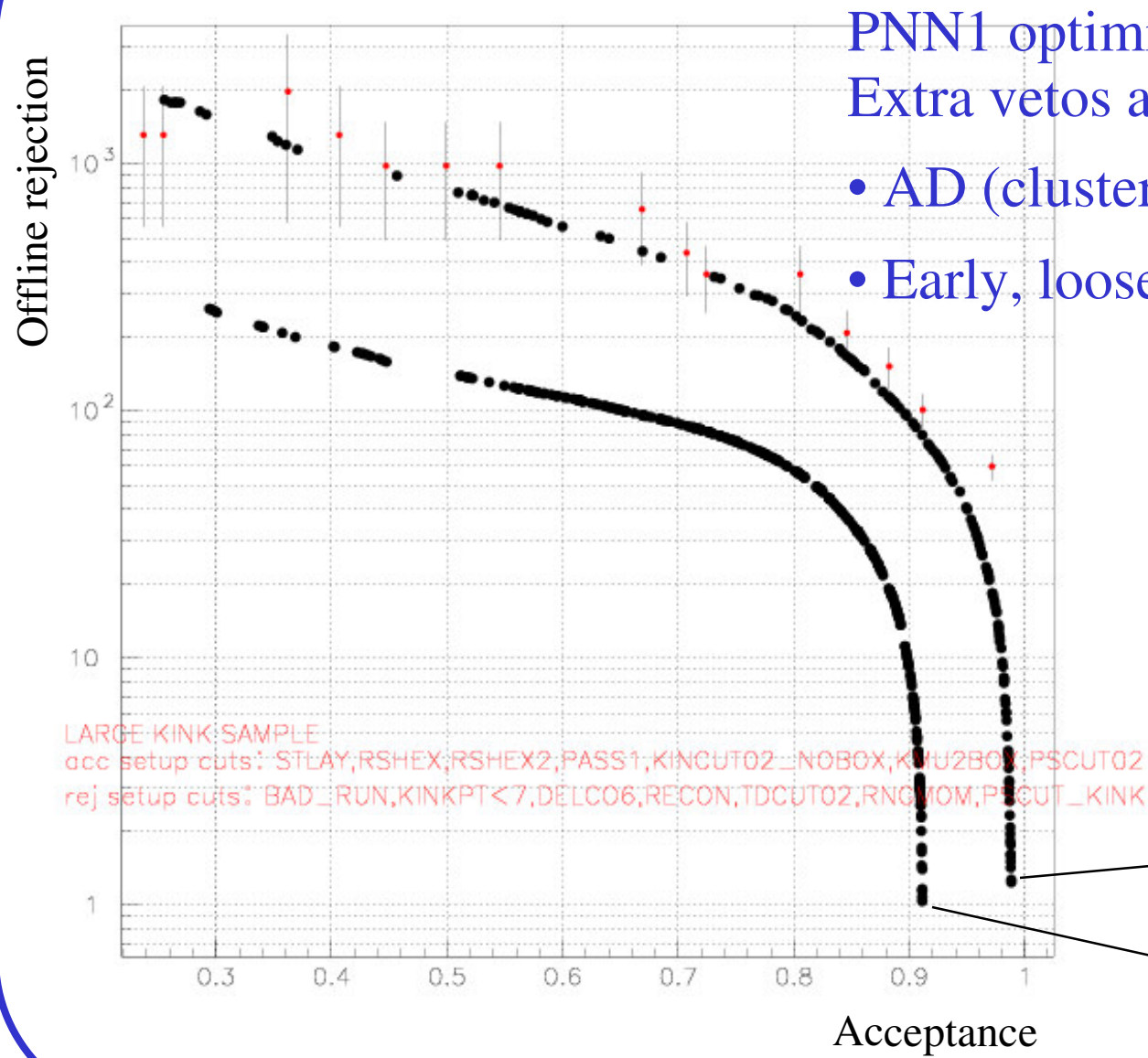
Rejection sample:

- pnn1or2 kinks (kinkqual=1)
142.1k
- BAD_RUN, UTBFLD>9.9,
online PV
141.8k
- ITGQUALT<7, DELCO6,
NDCLAY>9, KINKPT<7
28.5k
- TDCUT02
14.2k
- PSCUT02_KINK
3.9k

In PNN2BOX 741

In KP2BOX 2281

Result



PNN1 optimized parameters used.
Extra vetos applied:

- AD (clustered around TRS)
- Early, loose BV cut

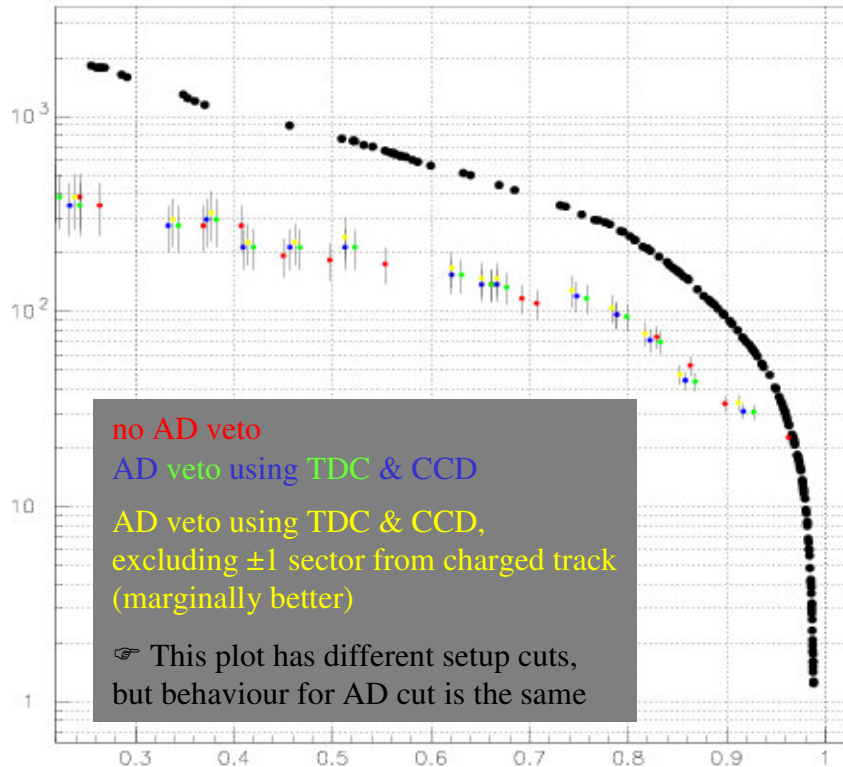
✌ ~3-5 improvement!

For reference:

PNN1 '02

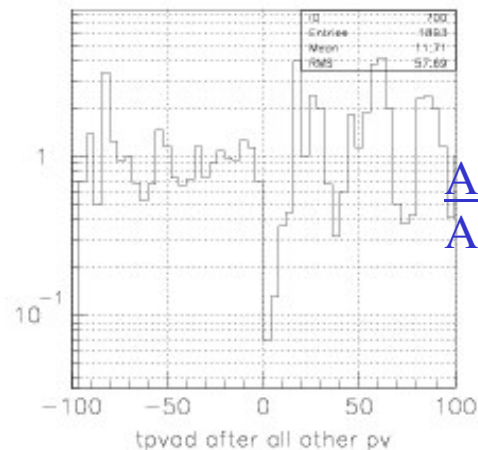
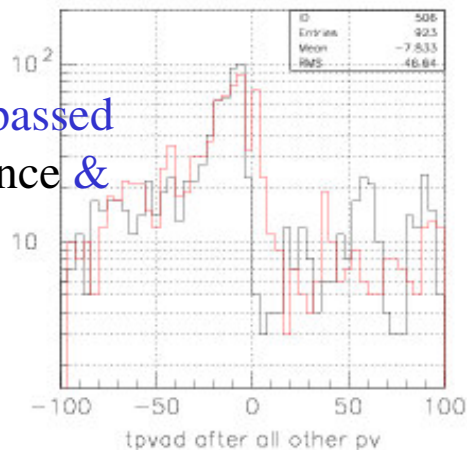
PNN2 '98

AD veto



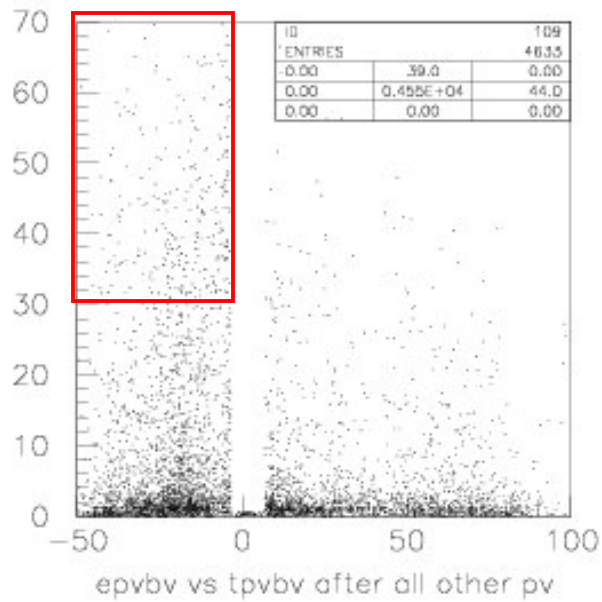
Use TDC time, CCD energy to cut events w/ sufficient energy in TRS not due to incoming beam particle (time & sector cuts). Other configurations (CCD time & energy, fitted values...) don't make a significant difference.

AD TDC time of passed
 events for acceptance &
 rejection sample

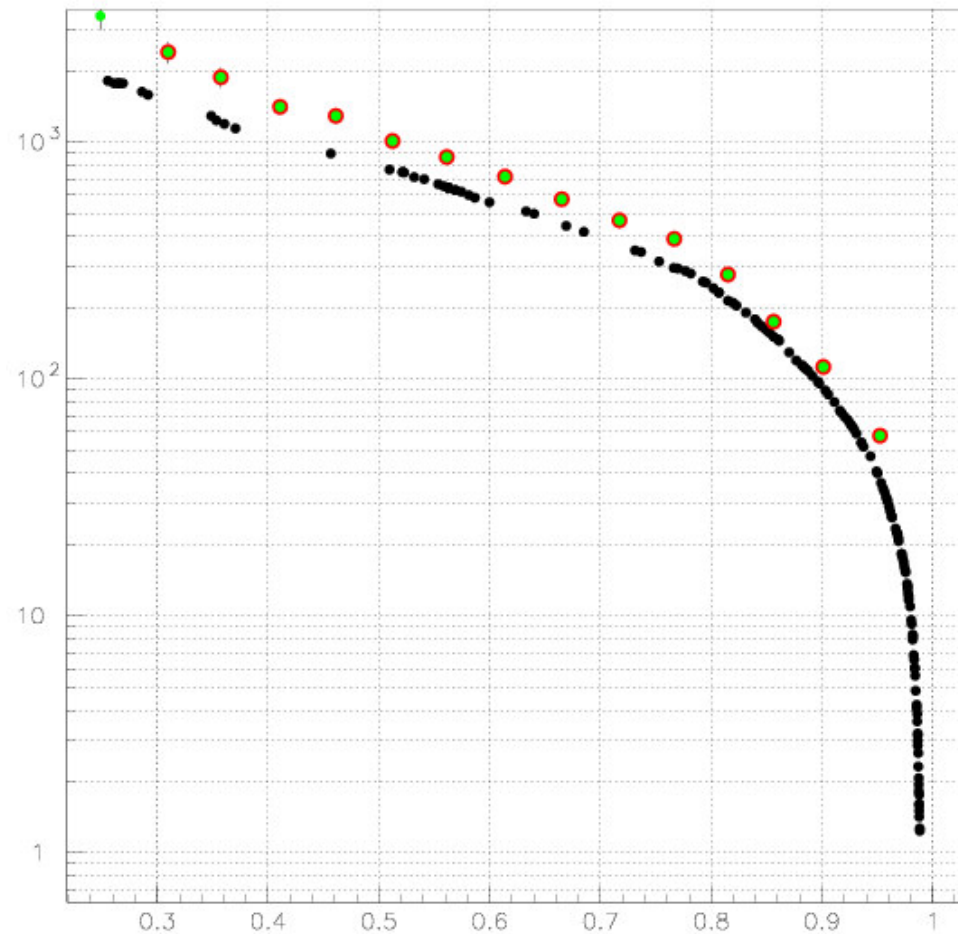


AD TDC for acc sample
 AD TDC for rej sample

Early, loose BV cut



BV energy vs time for pnn
events that passed all other PV



Surviving events

acceptance	No box	PNN2BOX	KP2BOX
0.24	3	0	3
0.26	3	0	3
0.36	2	0	2
0.41	3	0	3
0.45	4	0	4
0.50	4	0	4
0.54	4	0	4
0.67	6	0	5
0.71	9	1	7
0.73	11	2	8
0.80	11	2	8
0.84	19	5	12
0.88	26	7	15
0.92	39	12	21
0.97	66	13	35

These events had either

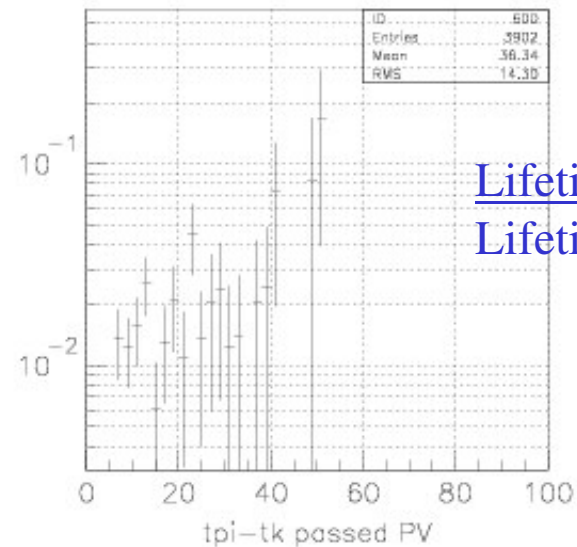
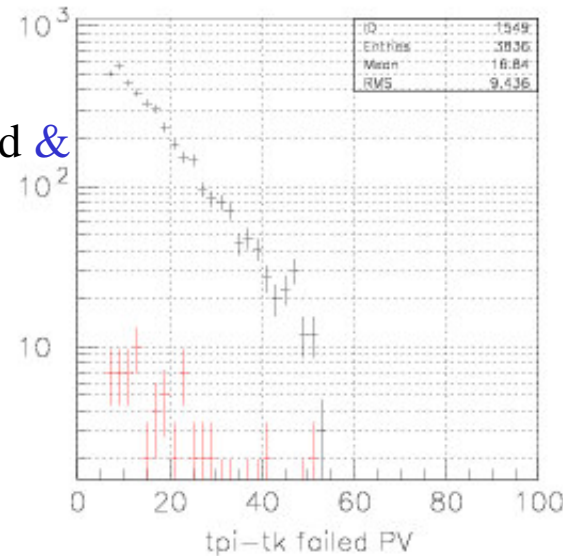
- ✓ spurs on the pi track in the TG
- ✓ track(s) coming from the back of the pi
- ✓ erroneous kink point, way out of fiber

? IC/TG edge kinks

➤ to be checked with newly processed kink sample

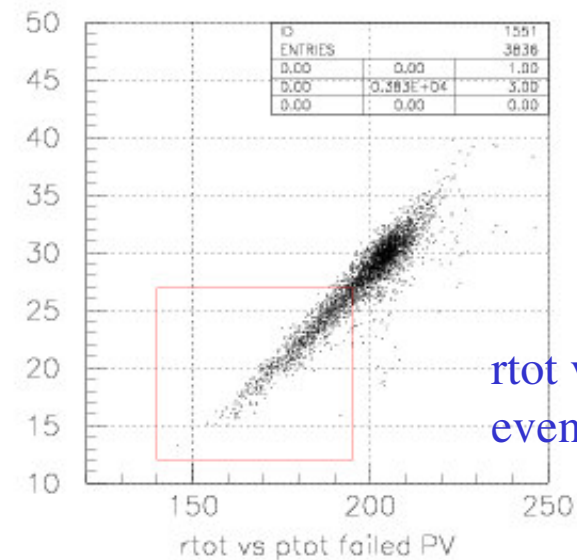
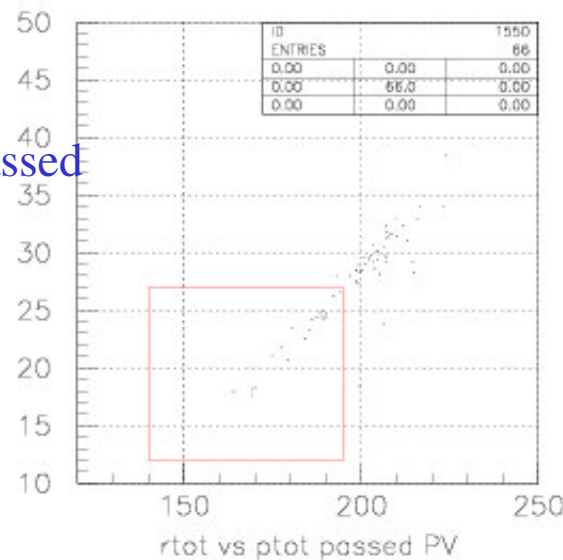
Some details (at 95% acc)

Lifetime of failed & passed events



Lifetime of passed
Lifetime of failed

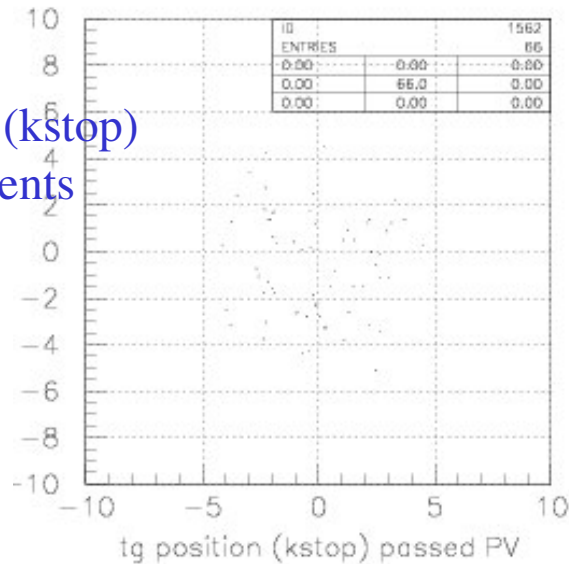
rtot vs ptot of passed events



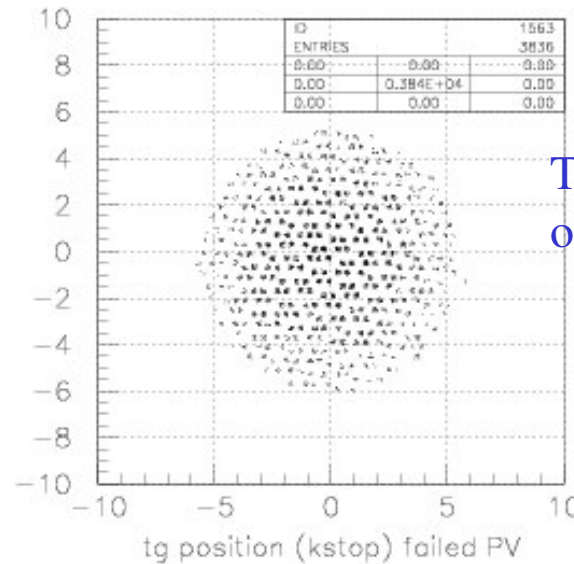
rtot vs ptot of failed events

Some details (at 95% acc)

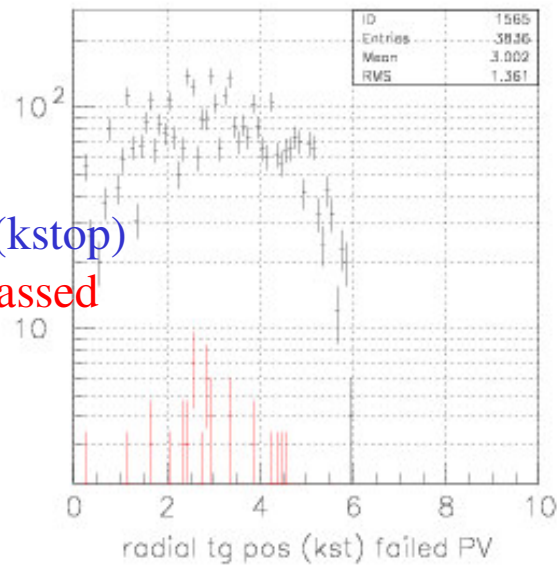
TG position (kstop)
of passed events



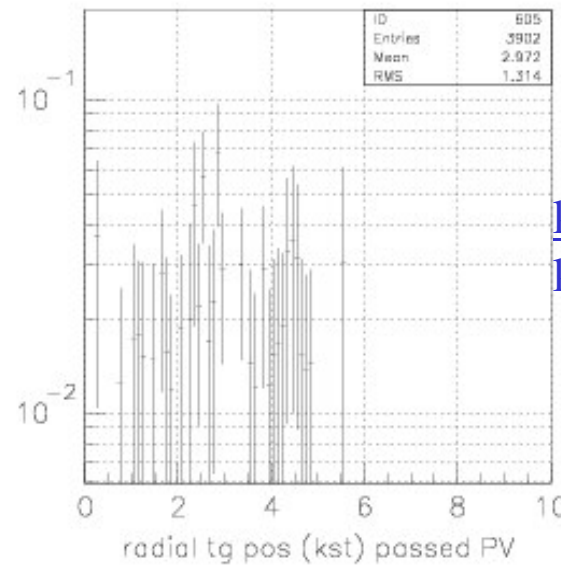
TG position (kstop)
of failed events



TG position (kstop)
of failed & passed
events

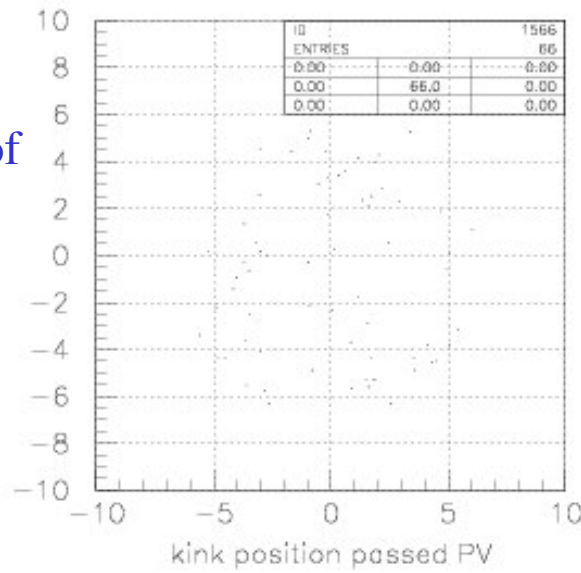


kstop of passed
kstop of failed

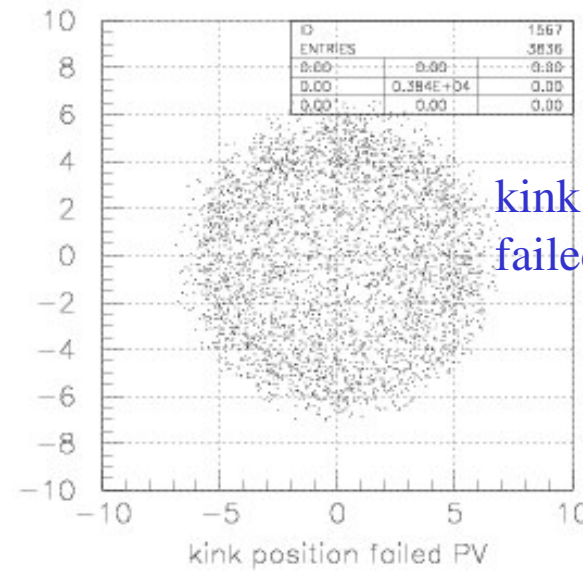


Some details (at 95% acc)

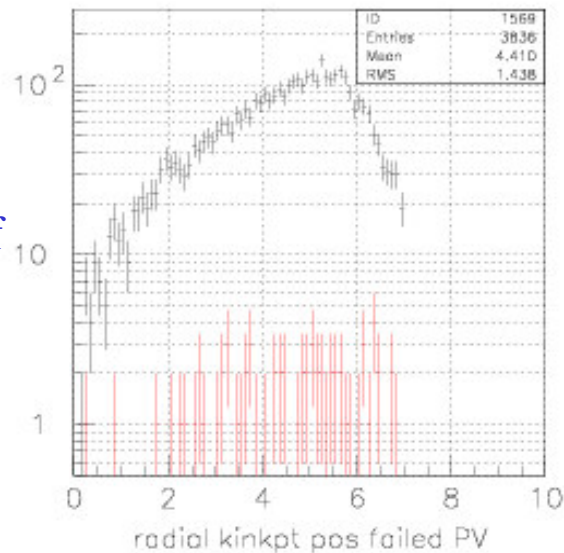
kink position of
passed events



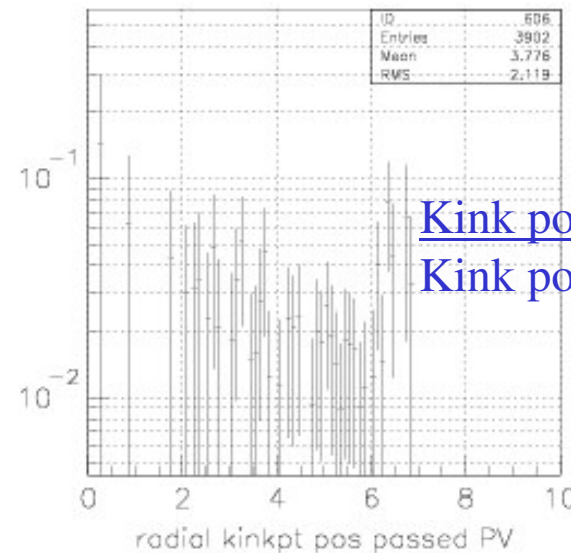
kink position of
failed events



kink position of
failed & passed
events



Kink position of passed
Kink position of failed

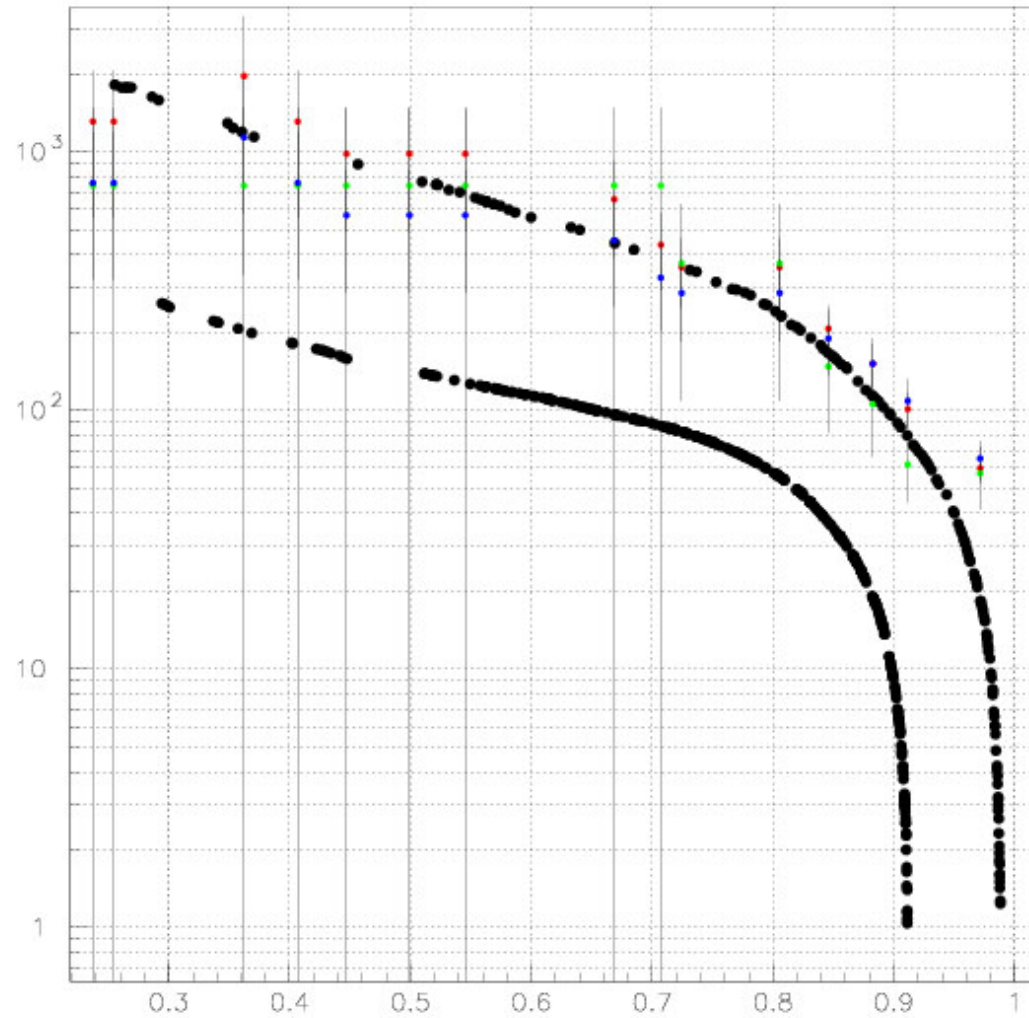


Kinematic dependence

No box cut

PNN2BOX

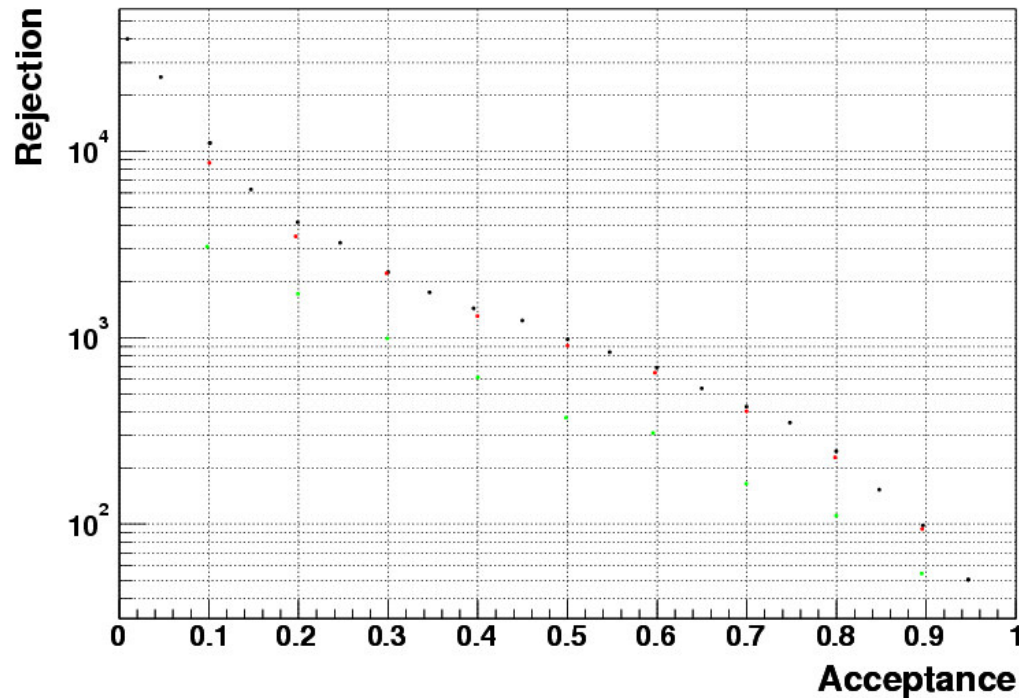
KP2BOX



Things to do

- Measure PV function w/ newly processed pnn2 data and larger statistics. Inspect surviving events to spot possible pathologies.
- More work to do on AD fitting.
- Use the new BVL TD code.
- Can we optimize?
- Measure separate subsystem contribution to the PV rejection for the kinked events

Splitting the 4th BV layer



	t off	t win	E thr	
BV 1-4	2.05	5.6	0.4	Not split
BV 1-3	0.05	3.6	0.4	Split
BV 4	2.05	4.8	0.4	

Treat 4th BV layer as separate subsystem, reoptimize (pnn1 data).
More subsystems get perturbed (mainly time offsets), BV layers 1-3 change, but overall rejection worse!